AMENDMENTS TO THE CLAIMS

Claims 1-17 (canceled)

Claim 18 (currently amended): A method of controlling an excimer laser unit to perform cornea ablation to reduce presbyopia, the ~~methodcomprising~~ method comprising the step of:

a) controlling said excimer laser unit to produce on the cornea a photoablative pattern inducing a fourth-order ocular aberration;

wherein said induced fourth-order aberration is a spherical aberration; and

wherein said step a) further comprises the steps of:

a1) acquiring and interpreting an aberrometric map of the eye indicating the visual defects of the eye, said visual defects comprising second-order visual defects including hypermetropia, astigmatism, and myopia, and higher-order visual defects including spherical aberration, thereby detecting a fourth-order spherical aberration;

a2) if the detected spherical aberration is negative, supplying said excimer laser unit with an overcorrect photoablative pattern that results in an induced fourth-order positive spherical aberration after treatment, the overcorrect photoablative pattern being obtained by obtaining a photoablative pattern to correct a fourth-order spherical aberration that is ~~increasing it~~ increased numerically in absolute value from the detected fourth-order spherical aberration ~~to obtain an overcorrect photoablative pattern inducing spherical aberration, resulting in an induced spherical aberration after treatment~~;

a3) if the detected spherical aberration is positive, supplying said excimer laser unit with an overcorrect photoablative pattern that results in an induced

fourth-order positive spherical aberration after treatment, the overcorrect photoablative pattern being obtained by obtaining a photoablative pattern to correct a fourth-order spherical aberration that is ~~changing its sign and increasing it~~ opposite in sign and increased numerically in absolute value from the detected fourth-order spherical aberration ~~to obtain an overcorrect photoablative pattern inducing spherical aberration, resulting in an induced spherical aberration after treatment~~; and

a4) ~~supplying the photoablative pattern to~~ controlling said excimer laser unit ~~for implementation~~ to implement the overcorrect photoablative pattern on said cornea.

Claim 19-21 (canceled)

Claim 22 (previously presented): The control method as claimed in Claim 18; wherein said step a) also comprises the step of:

b) controlling said excimer laser unit to perform specific photoablative treatment related to the visual defect of the eye associated with the presbyopia.

Claim 23 (previously presented): The control method as claimed in Claim 22; wherein said step b) comprises the steps of:

c) if the visual defect of the eye is hypermetropia, controlling said excimer laser unit to perform the following operations:

c1) ablation of a circular corona of maximum 6 mm inside diameter, maximum 9 mm outside diameter, and of such a depth as to compensate the spherical defect;

c2) ablation with a customized ablative pattern to eliminate higher than second-order defects, with reference to aberrometric data acquired prior to the operation in the preceding point; and

c3) if the above operations fail to achieve a coefficient of Zernike's polynomial Z_4^0 ranging between 0.1 and 1.0, ablation with a customized ablative pattern to obtain even greater spherical aberration;

d) if the visual defect of the eye is hypermetropia and positive astigmatism or hypermetropia and negative astigmatism, controlling said excimer laser unit to perform the following operations:

d1) cylindrical ablation, with the excimer laser unit set solely to the cylindrical defect, to bring the cylindrical defect close to zero;

d2) ablation of a circular corona of maximum 6 mm inside diameter, maximum 9 mm outside diameter, and of such a depth as to compensate the spherical defect;

d3) ablation with a customized ablative pattern to eliminate higher than second-order defects, with reference to aberrometric data acquired prior to the operation in the preceding point; and

d4) if the above operations fail to achieve a coefficient of Zernike's polynomial Z_4^0 ranging between 0.1 and 1.0, ablation with a customized ablative pattern to obtain even greater spherical aberration;

e) if the visual defect of the eye is myopia, controlling said excimer laser unit to perform the following operations:

e1) ablation to such a depth as to compensate the spherical defect; and

e2) ablation with a customized ablative pattern to induce positive spherical aberration with a coefficient of Zernike's polynomial Z_4^0 ranging between 0.1 and 1.0;

f) if the visual defect of the eye is myopia and positive astigmatism or myopia and negative astigmatism, controlling said excimer laser unit to perform the following operations:

f1) cylindrical ablation, with the excimer laser unit set solely to the cylindrical defect, to bring the cylindrical defect close to zero;

f2) ablation to such a depth as to compensate the spherical defect; and

f3) ablation with a customized ablative pattern to induce positive spherical aberration with a coefficient of Zernike's polynomial Z_4^0 ranging between 0.1 and 1.0;

g) if the visual defect of the eye is emmetropia, controlling said excimer laser unit to perform:

g1) operations d2), d3) and d4), if the visual defect improves using a positive lens; and

g2) operations e1) and e2), if the visual defect improves using a negative lens;

h) if the visual defect of the eye is positive astigmatism or negative astigmatism, controlling said excimer laser unit to perform:

h1) operation d1) to achieve emmetropia;

h2) operations d2), d3) and d4), if the visual defect improves using a positive lens; and

h3) operations e1) and e2), if the visual defect improves using a negative lens.

Claim 24 (previously presented): The control method as claimed in Claim 18, also comprising the step of:

i) controlling said excimer laser unit to form on the cornea a photoablative pattern which also corrects higher-order aberrations.

Claim 25 (currently amended): ~~An~~ A controller for an excimer laser unit which performs cornea ablation to reduce presbyopia, the controller comprising:

a) first control means that controls said excimer laser unit to form on the cornea a photoablative pattern inducing a fourth-order ocular aberration;

wherein said induced fourth-order aberration is a spherical aberration; and

wherein said first control means comprise:

a1) aberrometric measuring means that acquires and interprets an aberrometric map of the eye indicating the visual defects of the eye, said visual defects comprising second-order visual defects including hypermetropia, astigmatism, and myopia, and higher-order visual defects including spherical aberration;

a2) first photoablative pattern generating means which are activated, if the detected spherical aberration is negative, to generate an overcorrect photoablative pattern that results in an induced fourth-order positive spherical aberration after treatment, the overcorrect photoablative pattern being generated by generating a photoablative pattern to correct a fourth-order spherical aberration that is numerically ~~increase~~ increased in absolute value from the fourth-order spherical aberration detected by said aberrometric measuring means~~[[,]] and so generate a photoablative pattern inducing spherical aberration, resulting in an induced spherical aberration after treatment~~;

a3) second photoablative pattern generating means which are activated, if the detected spherical aberration is positive, to generate an overcorrect photoablative pattern that results in an induced fourth-order positive spherical aberration after treatment, the overcorrect photoablative pattern being generated by generating a photoablative pattern to correct a fourth-order spherical aberration that is ~~change the~~ opposite in sign ~~of~~ and numerically ~~increase~~ increased in absolute value from the fourth-order spherical aberration detected by said aberrometric measuring means~~[[,]] and so generate a photoablative pattern inducing spherical aberration, resulting in an induced spherical aberration after treatment~~;

a4) supply means that supplies the overcorrect photoablative pattern so generated to said excimer laser unit for implementation on said cornea.

Claim 26-29 (canceled)

Claim 30 (previously presented): The ~~excimer laser unit~~ controller as claimed in Claim 29;

wherein said first control means:

c) if the visual defect of the eye is hypermetropia, control said excimer laser unit to perform the following operations:

c1) ablation of a circular corona with a maximum 6 mm inside diameter and a maximum 9 mm outside diameter, and of such a depth as to compensate the spherical defect;

c2) ablation with a customized ablative pattern to eliminate higher than second-order defects, with reference to aberrometric data acquired prior to the operation in the preceding point; and

c3) if the above operations fail to achieve a coefficient of Zernike's polynomial Z_4^0 ranging between 0.1 and 1.0, ablation with a customized ablative pattern to obtain even greater spherical aberration;

d) if the visual defect of the eye is hypermetropia and positive astigmatism or hypermetropia and negative astigmatism, control said excimer laser unit to perform the following operations:

d1) cylindrical ablation, with the excimer laser unit set solely to the cylindrical defect, to bring the cylindrical defect close to zero;

d2) ablation of a circular corona of maximum 6 mm inside diameter, maximum 9 mm outside diameter, and of such a depth as to compensate the spherical defect;

d3) ablation with a customized ablative pattern to eliminate higher than second-order defects, with reference to aberrometric data acquired prior to the operation in the preceding point; and

d4) if the above operations fail to achieve a coefficient of Zernike's polynomial Z_4^0 ranging between 0.1 and 1.0, ablation with a customized ablative pattern to obtain even greater spherical aberration;

e) if the visual defect of the eye is myopia, control said excimer laser unit to perform the following operations:

e1) ablation to such a depth as to compensate the spherical defect; and

e2) ablation with a customized ablative pattern to induce positive spherical aberration with a coefficient of Zernike's polynomial Z_4^0 ranging between 0.1 and 1.0;

f) if the visual defect of the eye is myopia and positive astigmatism or myopia and negative astigmatism, control said excimer laser unit to perform the following operations:

f1) cylindrical ablation, with the excimer laser unit set solely to the cylindrical defect, to bring the cylindrical defect close to zero;

f2) ablation to such a depth as to compensate the spherical defect; and

f3) ablation with a customized ablative pattern to induce positive spherical aberration with a coefficient of Zernike's polynomial Z_4^0 ranging between 0.1 and 1.0;

g) if the visual defect of the eye is emmetropia, control said excimer laser unit to perform:

g1) operations d2), d3) and d4), if the visual defect improves using a positive lens; and

g2) operations e1) and e2), if the visual defect improves using a negative lens;

h) if the visual defect of the eye is positive astigmatism or negative astigmatism, control said excimer laser unit to perform:

h1) operation d1) to achieve emmetropia;

h2) operations d2), d3) and d4), if the visual defect improves using a positive lens; and

h3) operations e1) and e2), if the visual defect improves using a negative lens.

Claim 31 (previously presented): The ~~excimer laser unit~~ controller as claimed in Claim 25~~[[,]] also comprising:~~ ;

~~i)~~ wherein the ~~second~~ first control means ~~that~~ also controls said excimer laser unit to form on the cornea a photoablative pattern which also corrects higher-order aberrations.

Claim 32 (previously presented): A method of reducing presbyopia, comprising the step of:

forming on the cornea a photoablative pattern inducing a fourth-order ocular aberration, resulting in a fourth-order ocular aberration after treatment.

Claim 33 (previously presented): The method as claimed in Claim 32;

wherein said fourth-order aberration is a spherical aberration.

Claim 34 (previously presented): The method as claimed in Claim 33;

wherein said spherical aberration is a positive spherical aberration.